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The Telegram (St. John's, NL)
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Muskrat Falls and true alternatives

By Jim Feehan

The province's energy corporation, Nalcor, favours developing Muskrat Falls as the best way to meet the island's future electricity needs.

According to Nalcor and its subsidiary, Newfoundland and Labrador Hydro, that multibillion-dollar hydro-electric project beats the alternative by a margin of about $2.2 billion plus it entails substantially less air pollution.

At present, Nalcor is in the midst of refining its cost estimates. It will be interesting to see how the finer estimates will affect that margin. At least we know that those figures are coming and will inform the debate.

When the new estimates are in, if that $2.2 billion advantage is not significantly reduced then the provincial government will assuredly continue to support the project.

But is the alternative, the so-called Isolated Island Option, truly the next best alternative?

As costs are being re-assessed, now is the opportune time to compare Muskrat Falls to a better alternative. The Isolated Island Option as currently designed is a bit of a straw man. There are ways to make it more competitive.

I can suggest five.

Cleaner fuel

First, use higher quality fuel to generate electricity. Under the Isolated Option, Nalcor's oil-burning plant at Holyrood, which generates about 15 per cent of the island's electricity (almost all the rest comes from on-island hydro-electric plants), has to continue operating and would have to provide a rising share of electricity production.

Nalcor says it would therefore have to spend almost $590 million to install scrubbers to eliminate the sulphur dioxide and particulate emissions that come out of that plant's smokestacks.

However, since 2005, Nalcor has reduced sulphur dioxide emissions, per megawatt (MW) hour of electricity generated, by about 65 per cent; particulates are down 75 per cent. This has been done by using cleaner fuel.

There is an even cleaner fuel available that could reduce those emissions by another 10 to 15 per cent.

It costs about 10 per cent more per barrel but it increases the plant's efficiency so less of it is needed. Also, it gives off less carbon emissions, whereas installing those expensive scrubbers actually increases carbon emissions.

Further reductions in sulphur and particulate emissions are desirable but not by increasing carbon emissions and burdening ratepayers with a $590 million bill.

Use the better quality fuel.

It is a fraction of that cost and reduces carbon emissions to boot. Doing so will reduce Muskrat Falls' advantage by hundreds of millions of dollars.

Better use the power we have

Secondly, Nalcor needs to improve its transmission system to better harness lost electricity.

Last year, the equivalent of about 800,000 MW hours was lost as water spilled over Nalcor's dams on the island.

That's huge! It's about 90 per cent of what Holyrood generated in the same year.

Most of this lost potential electricity occurred in the main part of the island and is likely due to the closure of the Grand Falls mill, past downsizing at the Corner Brook mill, and the weather.

Spill is highly variable, is sometimes unavoidable, and last year's was exceptionally large but the point is that with the Grand Falls mill gone and the Corner Brook mill consuming much less than in the past, electricity from central Newfoundland is available to be shifted to the Avalon Peninsula where the demand growth is.

That requires an upgrade to the transmission system.

If the lines don't have the capacity to carry more electricity from central Newfoundland, then not all the available water can be used and, if there is a lot of it, gets spilled over the dam.

There's a cost to adding transmission but that would have to be done even if Muskrat Falls went ahead.

Much of the spill occurs during the spring and summer months but when the Vale Nickel plant opens as a year-round operation, its demand for electricity can be met partly by reducing the spillage during those months.

Use of water that would have been otherwise spilled displaces burning fuel at Holyrood and leads to lower emissions from that plant. This makes the Isolated Option cheaper and cleaner.

More wind

Thirdly, more wind power should be added to the system.

Nalcor's Isolated Option had included only one small wind farm, planned for in 2014. Only two others of about the same size are in operation. Those two produce about 200,000 MW hours a year and their cost per MW hour is less than at Holyrood.

The extremely limited addition of one more wind farm was based on a 2004 study but there have been big improvements in wind technology since then.

Even Nalcor has backed away from its earlier position.

It's now saying that as part of its Gate 3 decision-making process, it will consider adding more wind. There are limits to adding wind


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power, because too much reliance on it can cause instability in the overall generation system.

Still, between 2018 and 2025, Nalcor should be able to add five more wind farms of the same size as planned for 2014.

These additions could produce approximately 450,000 MW hours per year. Again, this reduces reliance on burning oil to generate electricity. Also, as technology improves, adding more wind farms at a rate of one every two or three years between 2026 and 2035, if needed, will likely be feasible.

The overall effect could cut the Muskrat Falls advantage by several hundred million dollars.

Bring in smaller hydro

A fourth way to beef up the Isolated Option is to exempt some rivers from the ban on mini-hydro development.

Under that option, Nalcor includes three modest-sized hydro projects — Portland Creek, Round Pond and Island Pond, which would add about 465,000 MW hours annually. But that's it: no more hydro plants.

Nalcor admits that there are a number of smaller on-island sites that are economically feasible but argues against them because their electricity would be about 13 per cent more expensive than wind.

Yet, that still makes them less costly than Holyrood generation by a wide margin.

The other reason put forward not to do any mini-hydro projects is that there is a provincial government ban on them. A blanket ban that rules out even one project is an extreme constraint.

Of course, there are important environmental and social reasons for limiting river developments.

However, there is an environmental trade-off here because hydro energy displaces the burning of fossil fuels with its associated pollution and carbon emissions.

Furthermore, if Muskrat goes ahead, think of all the rivers, wilderness areas, hunting grounds and watersheds that would be affected by that project's hundreds and hundreds of kilometres of transmission lines.

A 1986 study, (and there has not been much new on this since the ban was first put in place in the 1990s) identified about 160 potential feasible on-island mini-development sites.

I suggest exempting a small number, say 10 or 12, from the ban. They could be selected from the set of 20 or 30 most attractive energy generating sites according to the ones with the least social and environmental costs. By my rough estimate, this could yield about another 450,000 MW hours annually.

The four actions that I have suggested so far are all to do with the supply side. They add cleaner energy to the system so less electricity has to be generated by burning oil.

Reduce demand

My fifth suggestion is to act to on the demand side to contain consumption growth.

Three policies come to mind.

One demand-side policy should be to begin implementing time-of-use (TOU) pricing.

Consumers would pay the standard rate for most times but there would be premium charged when the generation system is stressed by heavy use and there would be an offsetting discount for using electricity in the low-use hours.

The provincial government, through the PUB, should require all newly-constructed buildings and houses to install electric meters that have TOU technology.

The purpose of TOU pricing is to get people to shift some of their electricity consumption to off-peak hours. That avoids the need to build as many new generating plants and reduces the risk of black-outs. It's a cost-saver.

A second demand-side action is for the provincial government to tax excess electricity consumption. It could be on any portion of residential consumption that is more than, say, 3,000 kilowatt hours a month.

It should be no more than what is needed to bring the price up to the cost of generating electricity at Holyrood. (Students of economics will recognize this as marginal-cost pricing, which is fundamental for efficient use of a scarce commodity.) And this green tax should not be applied to Nalcor's rural customers who rely on diesel-generated electricity, because they already pay a hugely higher price for anything higher than 1,000 kilowatts hours a month.

By setting the tax only on the amount above 3,000 kilowatt hours, households without all-electric heat and many of those with electric heat, especially lower-income people and those in smaller houses and apartments, would not be affected.

Still, some of us would have to pay more, but heavy users will typically have the income and scope to find energy-saving solutions. Of course, no one wants to pay more, but remember that prices with Muskrat Falls also go up.

The third demand-side policy initiative could be to supplement existing provincial energy-saving programs by offering a short-term but generous subsidy for people to install heat pumps for existing homes.

Heat pumps save a lot of energy for consumers. Encouraging a substantial switch to them now will result in long-term gains.

Timely and strategic incorporation of all these suggestions into an integrated package would result in much less reliance on the burning of oil for electricity generation and could avoid the need for any additional oil-fired plants until the mid-2030s.

Around that time, the Holyrood plant will be so old that it will have to be replaced. There will be many replacement options 20 years from now.

They include offshore natural gas, imported liquefied natural gas, Muskrat Falls, and Gull Island; perhaps even access to Churchill Falls power.

However, even if we assume that Holyrood is re-built as an oil-burning plant, less oil will be burned there if this integrated package of actions is in place. The Muskrat Falls costs should be compared to this improved option under at least two possibilities: Holyrood is re-

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built to use offshore natural gas, and re-built to continue as an oil burner.

~~Muskrat Falls~~ is a much riskier project because it is one enormous investment at one point in time whereas the Isolated Island Option is a set of diverse smaller projects spread over time.

Therefore, when the new cost estimates are determined, ~~Muskrat Falls~~ must come in at a cost advantage that is big enough to compensate for the greater risk.

On top of that, for Muskrat Falls to be an attractive public investment, any cost advantage has to be over the truly best alternative, not some highly constrained option.

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